What is claimed is:

1. An image forming apparatus for uniformly charging a photoconductive element in rotation with a charger, exposing imagewise said photoconductive drum charged by said charger to thereby form a latent image, developing said latent image with a developing device using a forward developing system and including a casing, which is formed with an opening facing said photoconductive element, and a developer carrier facing said photoconductive element via said opening, and transferring a developed image to an image transfer member being conveyed, said image forming apparatus comprising:

feeding means for feeding a controlled gas to a position upstream, in a direction of rotation of the photoconductive element, of a developing position where the developing device operates;

developing zone switching means for selectively causing a developer layer deposited on the developer carrier to contact a developing zone of the photoconductive element in an image formation condition or to part from said developing zone in a stand-by condition; and

sealing means for maintaining, in the image forming condition, a gap between the photoconductive element and the casing at a position downstream of the developing zone

in the direction of rotation of said photoconductive element or sealing said gap in the stand-by condition.

2. The apparatus as claimed in claim 1, further comprising collecting zone switching means for causing, in the image forming condition, the developer layer on the developer carrier to contact an inner surface of the casing, which lies in a developer collecting zone, or causing, in the stand-by condition, said developer carrier to part said inner surface of said casing.

3. The apparatus as claimed in claim 2, wherein said developer carrier comprises a rotatable sleeve and a magnet roller disposed in said sleeve and formed with a plurality of magnetic poles equally spaced along an inner circumference of said sleeve, and

said developing zone switching means and said collecting zone switching means displace said magnet roller by a preselected angle in a direction of rotation.

4. The apparatus as claimed in claim 2, wherein said collecting zone switching means and said sealing means share a movable member mounted on the casing in such a manner as to be freely movable in a direction in which a gap between the developer carrier and the photoconductive element varies, and freely lockable at a desired position.

5. The apparatus as claimed in claim 2, wherein said developing zone switching means varies a position of the

casing relative to the photoconductive element to thereby cause the developer layer to selectively contact the developing zone of said photoconductive element, and

said collecting zone switching means and said sealing means share a movable member mounted on the casing in such a manner as to be freely movable in a direction in which a gap between the developer carrier and the photoconductive element varies, and freely lockable at a desired position, and an interlocking mechanism configured to displace said movable member in interlocked relation to a movement of said casing relative to said photoconductive element.

6. The apparatus as claimed in claim 2, further comprising:

depressurizing means controlled by said feeding means for lowering, in the stand-by condition, a pressure in the casing below a pressure of the controlled gas present at an upstream side in a direction of rotation of the developer carrier; and

interrupting means for interrupting an operation of said depressurizing means in the stand-by condition.

7. The apparatus as claimed in claim 6, wherein said depressurizing means comprises an exhaust passage fluidly communicated to the casing via a discharge opening, which is formed in said casing and open toward a downstream side

in a direction in which the controlled gas fed from said feeding means flows.

8. The apparatus as claimed in claim 7, wherein said discharge opening is positioned upstream of a path along which the controlled gas fed from said feeding means flows.

9. The apparatus as claimed in claim 8, further comprising a bladed wheel located at said discharge opening and having an axis of rotation parallel to said path along which the controlled gas fed from said feeding means flows.

10. The apparatus as claimed in claim 9, wherein said bladed wheel comprises an eccentric fan having an axis of rotation perpendicular to a direction in which the controlled gas fed from said feeding means flows.

11. The apparatus as claimed in claim 7, further comprising a fan rotatable at a variable speed and positioned on a path along which the controlled gas fed from said feeding means flows.

12. The apparatus as claimed in claim 6, wherein said developing region switching means, said collecting region switching means, said sealing means and said interrupting means share a single drive source.

13. The apparatus as claimed in claim 12, wherein said drive source drives the developing device as well.

14. The apparatus as claimed in claim 1, further

comprising:

depressurizing means controlled by said feeding means for lowering, in the stand-by condition, a pressure in the casing below a pressure of the controlled gas present at an upstream side in a direction of rotation of the developer carrier; and

interrupting means for interrupting an operation of said depressurizing means in the stand-by condition.

15. The apparatus as claimed in claim 14, wherein said depressurizing means comprises an exhaust passage fluidly communicated to the casing via a discharge opening, which is formed in said casing and open toward a downstream side in a direction in which the controlled gas fed from said feeding means flows.

16. The apparatus as claimed in claim 15, wherein said discharge opening is positioned upstream of a path along which the controlled gas fed from said feeding means flows.

17. The apparatus as claimed in claim 16, further comprising a bladed wheel located at said discharge opening and having an axis of rotation parallel to said path along which the controlled gas fed from said feeding means flows.

18. The apparatus as claimed in claim 17, wherein said bladed wheel comprises an eccentric fan having an axis

of rotation perpendicular to a direction in which the controlled gas fed from said feeding means flows.

19. The apparatus as claimed in claim 15, further comprising a fan rotatable at a variable speed and positioned on a path along which the controlled gas fed from said feeding means flows.

20. The apparatus as claimed in claim 14, wherein said developing region switching means, said collecting region switching means, said sealing means and said interrupting means share a single drive source.

21. The apparatus as claimed in claim 20, wherein said drive source drives the developing device as well.

22. The apparatus as claimed in claim 1, wherein the developer carrier comprises a rotatable sleeve and a magnet roller disposed in said sleeve and formed with a plurality of magnetic poles equally spaced along an inner circumference of said sleeve, and

said developing zone switching means comprises magnetic force generating means buried in the photoconductive element at a position facing the opening of the casing for selectively generating magnetic lines of force of a same polarity as the magnetic poles of said developer carrier.

23. An image forming apparatus for uniformly charging a photoconductive element in rotation with a

charger, exposing imagewise said photoconductive drum charged by said charger to thereby form a latent image, developing said latent image with a developing device using a forward developing system and including a casing, which is formed with an opening facing said photoconductive element, and a developer carrier facing said photoconductive element via said opening, and transferring a developed image to an image transfer member being conveyed, said image forming apparatus comprising:

feeding means for feeding a controlled gas to a position upstream, in a direction of rotation of the photoconductive element, of a developing position where the developing device operates;

collecting zone switching means for causing, in an image forming condition, the developer layer on the developer carrier to contact an inner surface of the casing, which lies in a developer collecting zone, or causing, in a stand-by condition, said developer carrier to part said inner surface of said casing; and

sealing means for maintaining, in the image forming condition, a gap between the photoconductive element and the casing at a position downstream of the developing zone in the direction of rotation of said photoconductive element or sealing said gap in the stand-by condition.

24. An image forming apparatus for uniformly

charging a photoconductive element in rotation with a charger, exposing imagewise said photoconductive drum charged by said charger to thereby form a latent image, developing said latent image with a developing device comprising a developer carrier, which is rotated in a direction opposite to said photoconductive element for depositing a developer on said latent image, and transferring a developed image to a recording medium being conveyed, said image forming apparatus comprising:

a casing included in said developing device and configured to cover the photoconductive element and storing the developer therein, the developer carrier being partly exposed via an opening, which is formed in said casing, and facing said photoconductive element;

an air conditioning box fluidly communicated to said opening of said casing from an upstream side in a direction of rotation of the developer carrier and configured to cover the charging device and part of a surface of the photoconductive element facing said charging device, a humidity-controlled gas being caused to flow via said air conditioning box;

an air conditioner configured to send the humidity-controlled gas into said air conditioning box;

a feed path providing fluid communication between said casing and said air conditioning box for causing the

humidity-controlled gas to flow;

a feeding section configured to feed the humidity-controlled gas from said air conditioning box to said casing via said feed path;

feeding means for causing said feeding section to feed the humidity-controlled gas to when the developer carrier is not driven; and

interrupting means for causing said feeding section to stop feeding the humidity-controlled gas when the developer carrier is driven.

25. The apparatus as claimed in claim 24, wherein the developing device comprises a guide member adjoining the photoconductive element and extending from said opening of said casing to a position close to an image transfer position where the developed image is transferred to the recording medium.

26. The apparatus as claimed in claim 25, wherein said guide member comprises a first guide portion configured to guide a viscous air flow produced on a surface of said image transfer member in a direction other than a direction in which said image transfer member moves.

27. The apparatus as claimed in claim 25, wherein said guide member comprises a second guide portion configured to guide a viscous air flow produced on a surface of the photoconductive element in a direction other than

a direction in which said surface moves.

28. The apparatus as claimed in claim 25, wherein said guide member comprises a suction path configured to suck a gas and an opening communicated to said suction path and adjoining the image transfer position.

29. An image forming apparatus for uniformly charging a photoconductive element in rotation with a charger, exposing imagewise said photoconductive drum charged by said charger to thereby form a latent image, developing said latent image with a developing device comprising a developer carrier, which is rotated in a direction opposite to said photoconductive element for depositing a developer on said latent image, and transferring a developed image to a recording medium being conveyed, said image forming apparatus comprising:

a casing included in said developing device and configured to cover the photoconductive element and storing the developer therein, the developer carrier being partly exposed via an opening, which is formed in said casing, and facing said photoconductive element;

an air conditioning box fluidly communicated to said opening of said casing from a downstream side in a direction of rotation of the developer carrier and configured to cover the charging device and part of a surface of the photoconductive element facing said charging device, a

humidity-controlled gas being caused to flow via said air conditioning box;

an air conditioner configured to send the humidity-controlled gas into said air conditioning box;

a discharge path via which the humidity-controlled gas flows out of said casing; and

a discharging section configured to discharge the humidity-controlled gas from said casing via said discharge gas by sucking said humidity-controlled gas.

30. The apparatus as claimed in claim 29, wherein the developer carrier and said discharging section are driven by a single drive source.

31. The apparatus as claimed in claim 30, further comprising:

a feed path providing fluid communication between said casing and said air conditioning box for causing the humidity-controlled gas to flow;

a feeding section configured to feed the humidity-controlled gas from said air conditioning box to said casing via said feed path;

feeding means for causing said feeding section to feed the humidity-controlled gas to when the developer carrier is not driven; and

discharging means for causing said discharging section to discharge the humidity-controlled gas when the

developer carrier is driven.

32. The apparatus as claimed in claim 31, wherein said feed path and said discharge path are fluidity communicated to each other, and said feeding section and said discharging section comprise a single section.

33. The apparatus as claimed in claim 32, further comprising:

a blocking/unblocking section configured to selectively block or unblock said feed path and said discharge path for thereby selecting either one of said feed path and said discharge path; and

switching means for causing said blocking/unblocking means to select said discharge path when the developer carrier is driven or select said feed path when said developer carrier is not driven.

34. The apparatus as claimed in claim 29, further comprising:

a feed path providing fluid communication between said casing and said air conditioning box for causing the humidity-controlled gas to flow;

a feeding section configured to feed the humidity-controlled gas from said air conditioning box to said casing via said feed path;

feeding means for causing said feeding section to feed the humidity-controlled gas to when the developer

carrier is not driven; and

discharging means for causing said discharging section to discharge the humidity-controlled gas when the developer carrier is driven.

35. The apparatus as claimed in claim 34, wherein said feed path and said discharge path are fluidity communicated to each other, and said feeding section and said discharging section comprise a single section.

36. The apparatus as claimed in claim 35, further comprising:

a blocking/unblocking section configured to selectively block or unblock said feed path and said discharge path for thereby selecting either one of said feed path and said discharge path; and

switching means for causing said blocking/unblocking means to select said discharge path when the developer carrier is driven or select said feed path when said developer carrier is not driven.

37. The apparatus as claimed in claim 29, wherein the developing device comprises a guide member adjoining the photoconductive element and extending from said opening of said casing to a position close to an image transfer position where the developed image is transferred to the recording medium.

38. The apparatus as claimed in claim 37, wherein

said guide member comprises a first guide portion configured to guide a viscous air flow produced on a surface of said image transfer member in a direction other than a direction in which said image transfer member moves.

39. The apparatus as claimed in claim 37, wherein said guide member comprises a second guide portion configured to guide a viscous air flow produced on a surface of the photoconductive element in a direction other than a direction in which said surface moves.

40. The apparatus as claimed in claim 37, wherein said guide member comprises a suction path configured to suck a gas and an opening communicated to said suction path and adjoining the image transfer position.

41. An image forming apparatus comprising developing means for developing, in a developing zone where an image carrier carrying a latent image thereon and a developer carrier carrying a developer thereon face each other, said latent image by feeding said developer to said latent image to thereby produce a corresponding toner image, said image forming apparatus comprising:

a rotatable member adjoining the developer carrier and the image carrier at a position upstream of the developing zone in a direction in which a surface of said developer carrier moves, said rotatable member rotating such that a surface of said rotatable member moves in a

same direction as said surface of said developer carrier at a position where said surfaces face each other; and

a passage forming member formed with a slit extending in an axial direction of said rotatable member and configured to form a passage therein, said rotatable member facing said slid;

wherein a controlled gas is caused to flow via said passage.

42. The apparatus as claimed in claim 41, further comprising:

a developing device comprising the developing means, which includes an end wall member; and

a facing member facing the developer carrier via a small gap at a side upstream of said rotatable member in a direction in which the surface of the image carrier moves, wherein said end wall member and an end portion of said facing member are held in close contact with or formed integrally with each other;

wherein at least one projection protrudes form said end wall member toward the image carrier, and

said image carrier is formed with a groove receiving said projection.

43. The apparatus as claimed in claim 42, further comprising means for moving said rotatable member in a direction in which a distance between said rotatable

member and said image carrier varies.

44. The apparatus as claimed in claim 41, wherein fibers are implanted on a surface of said rotatable body and contact said passage forming member.

45. The apparatus as claimed in claim 41, further comprising:

a pressure sensor for sensing a pressure in the developing device; and

depressurizing means disposed in the developing device and having a variable depressurizing ability;

wherein a rotation speed of the developer carrier, and

the depressurizing ability of said depressurizing means is controlled to maintain the pressure in the developing device constant.

46. The apparatus as claimed in claim 41, further comprising a pressure sensor for sensing a pressure in the developing device, wherein a rotation speed of the developing device is variable and is controlled, during operation, to maintain said pressure constant.

47. An image forming apparatus comprising developing means for developing, in a developing zone where an image carrier carrying a latent image thereon and a developer carrier carrying a developer thereon face each other, said latent image by feeding said developer to said

latent image to thereby produce a corresponding toner image, said image forming apparatus comprising:

a rotatable member adjoining the developer carrier and the image carrier at a position downstream of the developing zone in a direction in which a surface of said developer carrier moves, said rotatable member rotating such that a surface of said rotatable member moves in an opposite direction to said surface of said developer carrier at a position where said surfaces face each other; and

a passage forming member formed with a slit extending in an axial direction of said rotatable member and configured to form a passage therein, said rotatable member facing said slid;

wherein a controlled gas is caused to flow via said passage.

48. The apparatus as claimed in claim 47, further comprising:

a developing device comprising the developing means, which includes an end wall member; and

a facing member facing the developer carrier via a small gap at a side upstream of said rotatable member in a direction in which the surface of the image carrier moves, wherein said end wall member and an end portion of said facing member are held in close contact with or formed

integrally with each other;

wherein at least one projection protrudes form said end wall member toward the image carrier, and

said image carrier is formed with a groove receiving said projection.

49. The apparatus as claimed in claim 48, further comprising means for moving said rotatable member in a direction in which a distance between said rotatable member and said image carrier varies.

50. The apparatus as claimed in claim 47, wherein fibers are implanted on a surface of said rotatable body and contact said passage forming member.

51. The apparatus as claimed in claim 47, further comprising:

a pressure sensor for sensing a pressure in the developing device; and

depressurizing means disposed in the developing device and having a variable depressurizing ability;

wherein a rotation speed of the developer carrier, and

the depressurizing ability of said depressurizing means is controlled to maintain the pressure in the developing device constant.

52. The apparatus as claimed in claim 47, further comprising a pressure sensor for sensing a pressure in the

developing device, wherein a rotation speed of the developing device is variable and is controlled, during operation, to maintain said pressure constant.